# Kelliella elegantula sp. nov., First Record of the Genus from British Columbia, Canada (Bivalvia: Kelliellidae) 

by

F. R. BERNARD<br>Department of Fisheries \& Oceans, Pacific Biological Station, Nanaimo, British Columbia, Canada V9R 5K6 and Research Associate in Malacology, Los Angeles County Museum of Natural History, Los Angeles, California 90007, U.S.A.


#### Abstract

Kelliella elegantula sp. nov. is proposed for a specimen taken in 1760 m near Triangle Island, British Columbia. It is the first record of the genus from British Columbia. Survey of the genus reveals a uniform conchology, but two anatomical types, suggesting that abyssal and hadal species be separated from the shallow-water species.


The genus Kelliella Sars, 1870 (=Kellyella Fischer, 1887, nom. null.), includes 14 species of small and usually deepwater bivalves. The type of the genus is $K$. abyssicola Sars, 1870, which occurs in the northeast Atlantic Ocean from Norway to West Africa and the Mediterranean Sea in 40 to 1200 m . The species was soon synonymized with $V e$ nus(?) miliaris Philippi, 1844, a Tertiary fossil of Italy. This was confirmed by comparison of topotypes with living material from Norway (OdHNER, 1960). The genus clearly belongs to the order Veneroida. The hinge is feeble and probably neotenous, and lateral teeth are absent. Usually assigned to the superfamily Arcticacea Newton, 1891, which conclusion is supported by the gross anatomy, particularly the gill, and structure of the alimentary canal, which is basically similar to that described in Glossus humanus (Linnaeus, 1758) by Owen (1953) and reviewed by Purchon (1987). The shell structure of $K$. miliaris is entirely aragonitic, with a poorly differentiated outer layer and a thin complex crossed-lamellar inner layer. This structure is similar to some representatives of the Glossacea and Arcticacea (Taylor et al., 1973). The genus is placed in the family Kelliellidae Fischer, 1887, together with several extinct Eocene and Oligocene genera that are only doubtfully related, and two living Indo-Pacific genera that on conchological grounds can only be doubtfully included in the family.

All the species of Kelliella are small to minute and generally confined to abyssal and hadal depths. The conchological characters are remarkably uniform, but significant
anatomical differences suggest that those species with a single pallial fusion and a greatly hypotrophied gill outer demibranch, typified by the type of the genus, may be separated at the generic level from the deep-water species with inhalant and exhalant apertures, and only slightly


Figure 1
Kelliella elegantula Bernard, sp. nov. Interior view of right and left hinge.

Table 1
Living species of the genus Kelliella

| Species | Location | Depth (m) |
| :--- | :--- | :---: |
| *Callocardia(?) adamsi E. A. Smith, 1885 | Northeast Pacific | 4410 |
| *Callocardia(?) atlantica E. A. Smith, 1885 | Sierra Leone | 1860 |
| $\dagger$ Vesicomya brunni Filatova, 1969 | Kermadec Trench | 9000 |
| $\dagger$ Kelliella elegantula sp. nov. | Northeast Pacific | 1760 |
| $\dagger$ Kelliella galathea Knudsen, 1970 | Eastern Pacific | 3570 |
| Kellyella goesi Odhner, 1960 | West Indies | $360-540$ |
| $\dagger$ Kelliella indica Knudsen, 1970 | Indian Ocean | 4350 |
| Venus(?) miliaris Philippi, 1844 | Northeast Atlantic | $50-1200$ |
| *Kelliella nakayamae Habe, 1953 | Pleistocene Japan |  |
| *Kelliella nitida Verrill, 1885 | Northwest Atlantic | 3800 |
| $\dagger$ Callocardia(?) pacifica E. A. Smith, 1885 | Mid north Pacific | 5394 |
| *Diplodonta pilula Dall, 1881 | Caribbean Sea | 570 |
| $\dagger$ Kelliella sundaensis Knudsen, 1970 | Sunda Trench | 6900 |
| $\dagger$ Kelliella tasmanensis Knudsen, 1970 | Tasman Sea | 4400 |

* Anatomy not known.
$\dagger$ Species with separated inhalant and exhalant apertures.

reduced outer demibranchs. The necessity of this course will be established when the anatomy of more species has been surveyed.


## Kelliella elegantula Bernard, sp. nov.

## (Figures 1-3)

Original description: Shell small, globose, thin and hyaline, subequilateral, equivalve. Commissure without gape. Umbones prosogyrate, prominent. Anterior dorsal margin arched. Surface with equidistant concentric rounded riblets, interspaces narrow and deep. Riblets prominent on ventral part of disc and crenulating the inner shell surface. Periostracum polished, thin, and adherent. Lunule wide and demarcated by an incised line. Escutcheon absent. Ligament short, opisthodetic, external but sunk in groove.


Figure 2
Kelliella elegantula. Photograph of exterior of left valve and interior of right valve. Holotype specimen length 3.9 mm (BCPM 979-5440).


Figure 3
Gross anatomy of Kelliella elegantula with mantle partially removed, as seen from the left side. Abbreviations: a., anus; a.a., anterior adductor muscle; e.a., exhalant aperture; f., foot; g., gill; i.a., inhalant aperture; l.p., labial palp; m., mantle; t., tentacle.

Hinge plate narrow and delicate, dentition feeble. Each valve with short triangular anterior pseudocardinal tooth and longer reflexed posterior pseudocardinal tooth. Adductor muscle scars subequal and rounded. Pallial line entire, obscure.

Type locality: West coast of Triangle Island, British Columbia at $50^{\circ} 54.5^{\prime} \mathrm{N}, 130^{\circ} 12.0^{\prime} \mathrm{W}$ in 1760 m . Collected by D. B. Quayle, Fisheries \& Ocean Station 63-211 on 11 September 1964.

Holotype: The dimensions of the holotype are length 3.9, height 3.7, width 2.4 mm . The unique type is deposited in the British Columbia Provincial Museum, Victoria, Canada (BCPM 979-5440).

Etymology: The specific name is derived from the Latin elegans, meaning "choice" and "beautiful," referring to the elegance of the shell.

Anatomy: The specimen was fixed in alcohol and dried. After rehydration the following anatomical observations could be made. Exhalant aperture with short collarlike siphon. The inhalant aperture a simple slit. Apertures with 6 thin tentacles. Foot digiform, with obscure byssal groove, but no appearance of a functional byssus. Gills large and thickened, flat, heterorhabdic, inner demibranch larger. Labial palps small, upper pair joined to form an overhanging oral hood. Stomach globular, with large dorsal hood and extensive gastric shield. Major and minor typhlosoles prominent. Mid-gut and style pouch conjoined. Ducts to the digestive diverticula in three groups. Intestine direct, passing through the ventricle of the heart. Anus projecting as a long simple papilla.

Comparisons: The new species is readily distinguished from the other Pacific Ocean representatives by the more robust dentition, similar to that of Kelleella mulıaris as described by Clausen (1958), but it differs from that species by the separate inhalant and exhalant apertures, the absence of hypertrophy of the inner mantle fold of the pedal opening, the more nearly equal demibranchs, the digiform foot lacking a heel, and the absence of the bundle of cilia on the anal papilla. The new species is superficially similar to $K$. goesi (based on illustration, holotype probably in the Naturhistoriska Museet, Sweden) but lacks the characteristic external punctae, and the sculpture is more subdued. There is some resemblance to $K$. galathea (holotype in the Zoological Museum, University of Copenhagen) which lacks the triangular anterior pseudocardinal tooth, and the shell is thinner and more inflated.

## LITERATURE CITED

Clausen, C. 1958. On the anatomy and histology of the Eulamellibranch Kelliella miliaris (Philippi) with observations on the ciliary mechanism of the mantle cavity. Nyt Mag. Zool. 6:144-175.
Odhner, N. H. 1960. Mollusca. Reps. Swedish Deep-Sea Exped. Zoology 2:367-400, 2 pl.
Owen, G. 1953. On the biology of Glossus humanus (L.) (Isocardia cor Lam.). Jour. Mar. Biol. Assoc. U.K. 32:85-106.
Purchon, R. D. 1987. The stomach in the Bivalvia. Phil. Trans. Roy. Soc. Lond. B, 316:183-276.
Taylor, J. D., W. J. Kennedy \& A. Hall. 1973. The shell structure and mineralogy of the Bivalvia. 2. LucinaceaClavagellacea. Conclusions. Bull. Brit. Mus. (Natur. Hist.) Zool. 22:255-294, 15 pl .

